



G.C.E. A/L Examination March - 2017

Conducted by Field Work Centre, Thondaimanaru

In Collaboration with

Provincial Department of Education Northern Province.

Grade :- 12 (2018)

CHEMISTRY

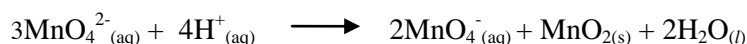
PART - II

B. Essay Questions.

❖ Answer any two questions from this part.

(01) (a) (i) What do you mean by disproportionation reaction?

(ii) The manganate (VI) ion in acid solution a disproportionation reaction as follow.



Write the half ion equation for oxidation and reduction of the above reaction

(iii) Give two disproportionation reactions with the balanced chemical equation.

(b)

(i) Write the balanced chemical equation of H_2S with the following reagents

(I) K_2CrO_4 (II) FeCl_3 (III) KMnO_4

From that calculate the number of the moles of each reagents that react 1mol of H_2S to sulphur.

(ii) When a tablet weighing 0.940g was dissolved in dilute sulphuric acid and the resulting solution titrated with 0.016mol dm^{-3} $\text{K}_2\text{Cr}_2\text{O}_7$ exactly 32.50cm^3 of the $\text{K}_2\text{Cr}_2\text{O}_7$ solution were required to reach the end point. Calculate the percentage by mass of Fe^{2+} in the tablet. ($\text{Fe} = 56$)

(c) (i) Sodium carbonate crystals (27.80g) were dissolved in water made up to 1.0dm^3 25.0cm^3 of the solution were neutralized by 48.80cm^3 of hydrochloric acid of concentration 0.10mol dm^{-3} Find x in the formula $\text{Na}_2\text{CO}_3 \cdot x\text{H}_2\text{O}$.

($\text{Na} = 23, \text{C} = 12, \text{H} = 1, \text{O} = 16$)

(150 Marks)

(02) (a)

(i) Write molecular Kinetic equation of gases and indicate all terms in the equation.

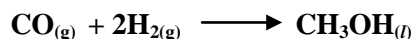
(ii) Derive $\sqrt{C^2} = \sqrt{\frac{3RT}{M}}$ from equations for ideal gas.

(iii) Calculate root mean square speed of He gas at 27°C . ($\text{He} = 4$)

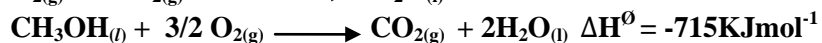
(iv) Write four factors that influence diffusion rate of gases.

(b)

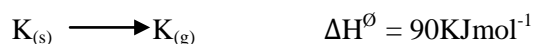
- (i) State Hess's Law.
(ii) Find the standard enthalpy change for the reaction.



Use the datas



- (iii) Construct a Born – Haber cycle for the formation of solid potassium chloride from its elements in their standard states use the data below and Calculate the standard enthalpy of formation of $\text{KCl}_{(s)}$



(03) (a) The first three ionization energy of an element M are 738, 1449, 7728 kJmol^{-1} respectively. The halide of M give colourless flame Bunsen flame the solution of nitrate of M gives white precipitate with $\text{NaOH}_{(aq)}$. This precipitate will not dissolve in excess of $\text{NaOH}_{(aq)}$. M liberate NO_2 with Concentrated HNO_3

- (i) Identify the element M.
(ii) Write the electronic configuration of M.
(iii) Write the balanced chemical equations of M when it is heated with air.
(iv) When we add water to the products obtained in a(iii) release a gas Identify the gas.
(v) Write the balanced chemical equation between M and HNO_3 .
(vi) Write two uses of M.

- (b) (i) Explain why both group 1 and 2 elements have melting points for metals and why group 1 melting points are lower than those of group 2.
(ii) Which is the only group 2 metal not to form more ionic compounds.
(iii) State which of each pair of compounds is more soluble.
1. Magnesium hydroxide and barium hydroxide.
2. Calcium sulphate and strontium sulphate (Sr SO_4)
(iv) Give two reactions as to why rubidium nitrate is more thermally stable than magnesium nitrate.

- (c) (i) Write the molecular formula of hydroxide of elements in period 3 indicate acid, base and amphoteric nature of their hydroxides.
(ii) Write the balanced chemical equation of amphoteric hydroxide obtained above with HCl and NaOH .
(150 Marks)